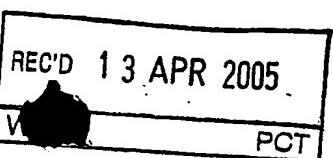


## PATENT COOPERATION TREATY

PCT



**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                             |                                                                 |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------|
| Applicant's or agent's file reference<br><br>PCT03089                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>FOR FURTHER ACTION</b>                                                   |                                                                 | See Form PCT/IPEA/416 |
| International application No.<br><br>PCT/CN03/00095                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | International filing date (day/month/year)<br><br>28 Jan. 2003 (28/01/2003) | Priority date (day/month/year)<br><br>27 Feb. 2002 (27/12/2002) |                       |
| International Patent Classification (IPC) or national classification and IPC<br><br>IPC7 C07D493/04, C07D493/22, A61K31/34                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                             |                                                                 |                       |
| <b>Applicant</b><br>SHANGHAI INSTITUTE OF MATERIA MEDICA, CHINESE ACADEMY OF SCIENCES et. al.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                             |                                                                 |                       |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 3 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of _____ sheets, as follows:<br/> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).<br/> <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the report</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul> |                                                                             |                                                                 |                       |

|                                                                                                                    |                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date of submission of the demand<br><br>9 Jun. 2004(09.06.2004)                                                    | Date of completion of this report<br><br>20 Mar. 2005(20.03.2005)                                                                                              |
| Name and mailing address of the IPEA/<br>6 Xitucheng Rd., Jimen Bridge, Haidian District,<br>100088 Beijing, China | Authorized officer<br><br>Liu shujing<br><br>Telephone No. 86-10-62085571 |
| Facsimile No. 86-10-62019451                                                                                       |                                                                                                                                                                |

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:

- international search (under Rules 12.3 and 23.1(b))
- publication of the international application (under Rule 12.4)
- international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished

the description:

pages \_\_\_\_\_ as originally filed/furnished  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

pages \_\_\_\_\_ as originally filed/furnished  
 pages \_\_\_\_\_ as amended (together with any statement) under Article 19  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

pages \_\_\_\_\_ as originally filed/furnished  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement:

Novelty (N)

Claims 1-8 \_\_\_\_\_ YES

Claims \_\_\_\_\_ NO

Inventive step (IS)

Claims 1-8 \_\_\_\_\_ YES

Claims \_\_\_\_\_ NO

Industrial applicability (IA)

Claims 1-8 \_\_\_\_\_ YES

Claims \_\_\_\_\_ NO

## 2. Citations and explanations (Rule 70.7)

## 2.1 The cited documents:

D1: CN1246121A (PHARMAGENESIS INC) , 1 Mar. 2002(01/03/2002), the whole document

D2: CN1261602A (CHENGDU DIAO PHARM CO CHINESE ACAD SCI) 2 Aug 2000 (02/08/2000)

the whole document

D3: CN1257507A (HOECHST MARION ROUSSEL INC.) 21 Jun 2000 (21/06/2000) the whole document

## 2.2 Novelty

The present invention provided triptolide derivatives of formula (I), which have a group other than H on 5- and/or 6- position of the parent structure of triptolide. But the structure of the triptolide disclosed in the prior art (documents 1-3), didn't have substitutes on the 5- and 6- positions. Therefore the subject matter of claims 1 – 8 appears to be novel and meet the requirements of Article 33(2) PCT.

## 2.3 Inventive step

The compounds of the present invention have different structure to the prior arts documents. The object of the present invention is to provide new triptolide derivatives that have high anti-inflammatory and immunology inhibition activities with lower toxicity. On account of the unexpected effects of the present compounds over the triptolide derivatives with H group on both 5-and 6- position have been given in the present invention and this modification of structures and improvement of effects is not obvious to a person skilled in the arts, the claims 1-8 fulfil the requirement of Article 33(3) PCT.

## 2.4 Industrial applicability

The compounds of the present invention can be made or used in the industry, therefore the subject matter can be considered industrial applicable and claims 1-8 fulfil the requirement of Article 33(3) PCT.